APPROACH TO PLEURAL EFFUSIONS

METU Talk

DIAGNOSTIC EVALUATION

- Careful Hx and PE
  - Eg, patient with obvious cause may not need further study (CHF with bilateral effusions, CA)
- Thoracentesis
  - Likely indicated in most patients
  - > 1 cm layering on lateral decubitus Xray, OK
  - < 1 cm: observe or u/s guidance

PLEURAL FLUID STUDIES

- Light's Criteria
  - Pleural LDH/Serum LDH > 0.6* -OR-
  - Pleural protein/Serum protein > 0.5 -OR-
  - Pleural LDH > 2/3 upper limit of normal (serum)
    - Usually > 200 IU
- Presence of ANY one: exudate
- Absence of ALL: transudate
- Sensitivity 99%, Specificity 98%

*LDH and "six" each have 3 letters

PLEURAL FLUID STUDIES*
Other Initial Diagnostic Studies

Pleural Fluid Studies	Cutoff Point
Pleural Fluid Protein	>2.9 g/dL
Pleural Fluid LDH	>0.45 upper limits of normal
Pleural Fluid Chol	>45 mg/dL
Pleural chol/Serum Chol	>0.3
Pleural albumin/Serum albumin	1.2 g/dL
Pleural bilirubin/Serum bilirubin	>0.6

*Heffner JE. Clinics in Chest Medicine. 1998;19:277-93.

PLEURAL FLUID STUDIES

- Most cost effective approach:
  - Order LDH, Protein labs
  - Hold fluid
  - Further studies ONLY if tests confirm exudate

TRANSUDATIVE EFFUSIONS
Clinical Diagnosis is Key

- CHF
  - Diuretic therapy can alter transudates to exudates
- Cirrhosis
- Nephrotic Syndrome
- Constrictive Pericarditis
- Atelectasis
- Peritoneal Dialysis
- Urinothorax (low pH, ⇑ pl/serum creatinine)
- Pulmonary Embolism (20% of effusions trans)
- Malnutrition

EXUDATIVE EFFUSIONS

- Initial diagnostic tests
  - Cell count with differential
  - Cytology
  - Gm stain, culture, AFB smear/culture
  - Glucose

EXUDATIVE EFFUSIONS

- RBC > 100,000/ mm
  - Malignancy, trauma, PE
  - > 10,000: common, not helpful
- Mesothelial cells
  - Low (< 5%) may be due to TB, empyema, pleurodesis
  - > 5% helps eliminate these as etiology
- Cytology
  - If initial fluid assuredly benign: < 3% chance of CA
  - If suspicious: repeat up to 3 times may be needed

EXUDATIVE EFFUSIONS

- WBC
  - PMNs: para-pneumonic, PE, rheumatoid
    - Does NOT R/O TB or CA
  - Lymphocyte predominant (>50%)
    - TB or CA
    - Sarcoid, lymphoma, rheumatoid arthritis
  - Eosinophilic (> 10% eos)
    - CA, trauma, pneumonia, parasites, asbestos, PTX
    - Rare with TB
    - Up to 1/3 idiopathic

EXUDATIVE EFFUSIONS

- Lymphocytic (> 50%)
  - CA (30-35%)
  - TB (15-20%)
  - Sarcoidosis
- PMNs
  - Empyema
  - Parapneumonic
  - Rheumatoid
  - Pulmonary infarction
- PMN or Lymphocytic
  - PE
  - Conn tissue disease
  - Post-cardiac injury

- Eosinophilic (> 10%)
  - Trauma
  - PTX
  - CA
  - Asbestos, parasites
  - Pneumonia
- RBC > 100,000/mm
  - CA
  - Trauma
  - Pulmonary infarction

EXUDATIVE EFFUSIONS
Other Tests

- Suspected TB
  - Adenosine deaminase (> 50 IU/L)
  - B_2 - microglobulin
  - Lysozyme III (> 20mcg/mL)
  - PCR (Sens 100%, Spec 95%)
  - AFB (smear 10-20%; cx 25-50%)
  - PPD
- Suspected Rheumatoid
  - Pleural RF
  - Low glucose
- Suspected SLE
  - Serum Complement
  - Pleural ANA
  - LE cells prep?
- Suspected Pneumonia
  - pH
- Suspected Pancreatitis
  - Pleural Amylase

BEYOND THORACENTESIS

- Pleural Biopsy
  - Most helpful in evaluating for TB
  - Limited utility for CA (40-50% positive)
    - Repeat cytology x 3
  - Sarcoid, fungal: might be helpful
- Thoracoscopy
  - Most helpful in evaluating for malignancy

UNDIAGNOSED PLEURAL EFFUSIONS

- 15-20% of effusions
- Careful review of history, PE, meds, risk factors
- Consider occult abdominal process
- Consider PE

UNDIAGNOSED PLEURAL EFFUSIONS

Cont'd

- Risk factors for TB or malignant effusion
  - Weight loss > 4.5 kg (10 pounds)
  - Fever > 38 C
  - Positive PPD
  - Large effusion (> 1/2 hemithorax)
  - < 95% lymphs in pleural fluid

- If ANY factor present, evaluate for TB, CA

UNDIAGNOSED PLEURAL EFFUSIONS
Cont'd

- PPD
  - If (+) and lymphocytic effusion, initiate TB treatment
  - If (-), repeat in 6-8 wks
    - However, if effusion < 5% mesothelial cells, consider TB treatment
  - If (-), not anergic, > 5% mesothelial cells, wait for repeat PPD in 6-8 wks
  - If repeat PPD (-), not anergic and cultures negative, observe

REFERENCES

- Ansari T, Idell S. Diseases of the pleura; management of undiagnosed persistent pleural effusions. Clin Chest Med. 1998;19:407-17.
- Heffner JE. Evaluating diagnostic tests in the pleural space; differentiating transudates from exudates as a model. Clin Chest Med. 1998;19:277-93.